

WHAT IS CLAIMED IS:

Sub B1
1. An external display device of a refrigerator comprising:

5 a display unit mounted on an outer case of the refrigerator, the display unit decoding a display control signal applied thereto, thereby executing a display operation; control means for converting the display control signal, adapted to control the display operation of the display unit, into serial data, and outputting the converted display control signal; and

10 a data signal line adapted to transmit data between the display unit and the control means in a serial manner.

15 2. The external display device in accordance with Claim 1, wherein:

the display unit converts a plurality of key input signals into serial data and outputs the serial data to the control means; and

20 the control means decodes the key input signals and executes a control based on the decoded key input signals.

3. An external display device of a refrigerator comprising:

25 a display unit mounted on an outer case of the

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refrigerator, the display unit recognizing a key input and converting the recognized key input into serial data, while decoding a display control signal indicative of an operating state of the refrigerator and executing a display operation based on the decoded signal;

control means for converting the display control signal into serial data and outputting the converted display control signal, while decoding a key signal received from the display unit and executing a control based on the decoded key signal; and

data signal line means adapted to transmit data between the display unit and the control means in a serial manner.

4. The external display device in accordance with Claim 3, wherein the display unit comprises auxiliary control means for receiving a command from the control means, thereby executing an intermediate control until the operating state of the refrigerator is displayed.

5. The external display device in accordance with Claim 3 ~~or 4~~, wherein the data signal line means comprises a single data signal line adapted to carry out a bi-directional data transmission/reception in an asynchronous manner.

6. The external display device in accordance with Claim

5, further comprising a voltage supply line for supplying a supply voltage to the control means and the auxiliary control means.

5 7. The external display device in accordance with Claim 6, wherein the voltage supply line or the data signal line extends through a hinge hole formed at a hinge adapted to connect a refrigerator door to a body of the refrigerator.

10 8. The external display device in accordance with Claim 7, wherein the data transmitted through the data signal line has a data format comprising a header portion indicative of the beginning of the transmission data, a command portion indicative of command data to be transmitted, a data portion
15 indicative of data appended to the command data, and a trailer portion indicative of the end of the transmission data.

a 20 9. The external display device in accordance with Claim 3 or 4, wherein the data signal line means comprises two data signal lines each adapted to carry out an uni-directional data transmission/reception in an asynchronous manner.

a 25 10. The external display device in accordance with Claim 3 or 4, wherein the data signal line means comprises a signal line for transmitting a clock signal, and two data signal

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lines each adapted to transmit data in a single direction in sync with the clock signal.

Sub B45
11. A method for controlling an external display device of a refrigerator adapted to display an operating state of the refrigerator while enabling a key selection for controlling the refrigerator, comprising the steps of:

10 determining whether a right of data transmission is assigned to the external display device or to a control unit of the refrigerator;

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15 converting, into serial data, a signal indicative of an operation state of the refrigerator when the data transmission right is assigned to the control unit while converting, into serial data, a key input signal when the data transmission right is assigned to the external display device, and outputting the resultant data; and

inputting the output data, decoding the data, and executing a control based on the decoded data.

20 12. A method for controlling an external display device, comprising the steps of:

determining whether or not there is data to be transmitted;

25 checking whether or not a right of data transmission is assigned;

if it is determined that there is data to be transmitted,
transmitting the data when there is a data transmission right
assigned, while executing a procedure for requesting the data
transmission right when there is no data transmission right;

5 determining whether or not there is data received; and

if it is determined that there is data received, continuously executing the current transmission mode when there is a data transmission right, while processing the received data when there is no data transmission right.

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